# Scientific Writing

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# Scientific writing

- Scientific writing is not just writing about science; it is the technical writing that scientists do to communicate their research to others. Scientific writing is predicated on the rigors of scientific inquiry, so it must reflect the same precision as that demanded in the research process.

# Science writer

- As a science writer you'll research, write and edit scientific news, articles and features, for business, trade and professional publications, specialist scientific and technical journals, and the general media.
- Science writers need to understand complex scientific information, theories and practices. You should be able to write in clear, concise and accurate language that can be understood by the general public.

# Purpose of Scientific & Medical Writing

- The main objective of medical and scientific writing is to record data. Without a written record of the findings and observations of researchers, no proof exists that any research was conducted by them, and valuable information obtained after a lot of effort may be lost. This may result in many experiments getting repeated, simply because there is no record of the data. Needless to say, this negligence has adverse impacts on the efficiency of sharing scientific knowledge

# Types of Scientific writing

- **What is scientific writing?**
- Peer-reviewed journal articles (presenting primary **research**)
- Grant **proposals** (you can't do science without funding)
- Literature review articles (summarizing and synthesizing **research** that has already been carried out)

# Writing a scientific text

- Clear **scientific writing** generally follows a specific format with key sections: an introduction to a particular topic, hypotheses to be tested, a description of methods, key results, and finally, a discussion that ties these results to our broader knowledge of the topic (Day and Gastel 2012).

# Writing a scientific text

- Scientific writing, while an indispensable step of the scientific process, is often overlooked in undergraduate courses in favor of maximizing class time devoted to scientific concepts. However, the ability to effectively communicate research findings is crucial for success in the biological sciences. Graduate students are encouraged to publish early and often, and professional scientists are generally evaluated by the quantity of articles published and the number of citations those articles receive.

# Writing a scientific text cont...

- It is therefore important that undergraduate students receive a solid foundation in scientific writing early in their academic careers. In order to increase the emphasis on effective writing in the classroom, we assembled a concise step-by-Step guide to scientific writing that can be directly disseminated to undergraduates enrolled in biological science courses.

# Writing a scientific text cont...

- The guide breaks down the scientific writing process into easily digestible pieces, providing concrete examples that students can refer to when preparing a scientific manuscript or laboratory report. By increasing undergraduate exposure to the scientific writing process, we hope to better prepare undergraduates for graduate school and productive careers in the biological sciences.

# Writing style guides

- Publication of research results is the global measure used by all disciplines to gauge a scientist's level of success. Different fields have different conventions for writing style, and individual journals within a field usually have their own style guides. Some issues of scientific writing style include:
- Some style guides for scientific writing recommend against use of the passive voice, while some encourage it. In the mathematical sciences, it is customary to report in the present tense.

# Writing style guides cont..

- Some journals prefer using "we" rather than "I" as personal pronoun or a first-person pronoun. The word "we" can sometimes include the reader, for example in mathematical deductions. The acceptability of passive voice in scientific writing is inconsistent. It is not always wanted, but is sometimes encouraged. One reason that passive voice is used in scientific writing is that it is beneficial in avoiding first-person pronouns, which are not formally accepted in science. It can be hard to make claims in active voice, that is, without the words, I" and "we". The reason that passive voice is sometimes discouraged is that it can be confusing, unless used carefully.

# Writing style guides cont..

- These two simplistic "rules" are not sufficient for effective scientific writing. In practice, scientific writing is much more complex and shifts of tense and person reflect subtle changes in the section of the scientific journal article. Additionally, the use of passive voice allows the writer to focus on the subject being studied (the focus of the communication in science) rather than the author. Similarly, some use of first-person pronouns is acceptable (such as "we" or "I," which depends on the number of authors). The best thing to do is to look at recent examples of published articles in the field

# Scientific report

- The stages of the scientific method are often incorporated into sections of scientific reports. The first section is typically the abstract, followed by the introduction, methods, results, conclusions, and acknowledgments. The introduction discusses the issue studied and discloses the hypothesis tested in the experiment. The step-by-step procedure, notable observations, and relevant data collected are all included in methods and results.

# Scientific report cont..

- The discussion section consists of the author's analysis and interpretations of the data. Additionally, the author may choose to discuss any discrepancies with the experiment that could have altered the results. The conclusion summarizes the experiment and will make inferences about the outcomes.  The paper will typically end with an acknowledgments section, giving proper attribution to any other contributors besides the main author(s). In order to get published, papers must go through peer review by experts with significant knowledge in the field. During this process, papers may get rejected or edited with adequate justification.

# Thesis or dissertation format

Generally a style manual is designated by an institution to which its thesis or dissertations must conform. One such manual is that of American Psychological Association (APA) publication manual.

According to this manual, the format is as follows

- **Title Page**
  - ✓ Title
  - ✓ Author's name and affiliation
  - ✓ Running head
  - ✓ Acknowledgements (if any)

# Thesis or dissertation format cont...

**Abstract**

- Introduction(no heading used)
- ✓ Statement of the problem
- ✓ Background / review of literature
- ✓ Purpose and rationale / hypothesis

**Method**

- ✓ Subjects
- ✓ Apparatus or instrumentation (if necessary)
- ✓ Procedure

**Results**

- ✓ Tables and figures(as appropriate)
- ✓ Statistical presentations

# Thesis or dissertation format cont...

- **Discussion**
  - ✓ Support or non support of hypothesis
  - ✓ Practical and theoretical implications
  - ✓ Conclusions
- **References**
- **Appendix (if appropriate)**

# The Modern Language Association (MLA)

The Modern Language Association (MLA) specifies a standard format for essays and research papers written in an academic setting:

- One-inch page margins.
- Double-spaced paragraphs
- A header with author's last name and page number one-half inch from the top of each page.
- Name of author, name of professor, title of course, date of paper on the first page of the paper.
- A works cited page beginning on a separate page at the end of the paper.
- Follow the steps below to format your essay or research paper according to MLA whenever you use Microsoft Word. Before you begin, however, make sure that you can see the **Standard and Formatting toolbars** displayed on two rows on your screen.

# Style & Page running

- The style requires double spacing throughout the paper. Single spacing should never be used. Margins of 1.5 inches at the top, bottom, right and left of every page should be given. All pages beginning with the title page except the figures should be given numbers. Title page and abstract are in separate pages. A new page is begun for the introduction, for the references for each table and figure and for each appendix.
- 
- The first page is the tile page. This page includes the title, author’s name and author’s affiliation near the top of the page, separated by double spaced. Toward the bottom of the page are the running head and acknowledgements, separated by a double space.

# Style & Page running

- The title should be concise and should indicate clearly the purposes of the study. It should not claim more for the study than it actually delivers. The title should be typed in upper case and lower case letters, centered and when two or more lined are needed, doubled spaced. The running head, a shortened version of the titled should be maximum of 50 characters including letters, punctuation and spaces between words. The running head is typed near the bottom of the page in upper case letters.
- Acknowledgements appear as unnumbered footnotes near the bottom of the title page. Acknowledgements are used to indicate the basis of a study (eg. Doctoral dissertation), grant support, review of prior draft of the manuscript and assistance in counting the research.

# Style & Page running

- The main body is decided into four major sections: introduction, method, results and discussion. The introduction begins on a new page and due to its position, does not need or have a label. A well-written introduction should contain a clear and definitive statement of the problem, the need for the research and its importance.
- In the review of previous literature, the researcher must demonstrate an understanding of the existing literature and only research that is pertinent to the issue under investigation should be included. It is also necessary to logically connect the previous body of literature with the current work.
- Another component of the introduction is a clear rationale for the hypothesis proposed, definition of the variables investigated and controlled and a formal statement of each hypothesis.

# Style & Page running

The method section describes in detail what the investigator did. A well written method section is sufficiently detailed to enable a reader to replicate the components of the study. The method section is separated from the introduction by the centered heading, ‘Method’. This should always include subjects and procedures. The sub section in subjects explains the participants of the study, the number of subjects, how they were selected, their demographic details etc. The procedure subsection describes the actual steps carried out in the study. This includes:

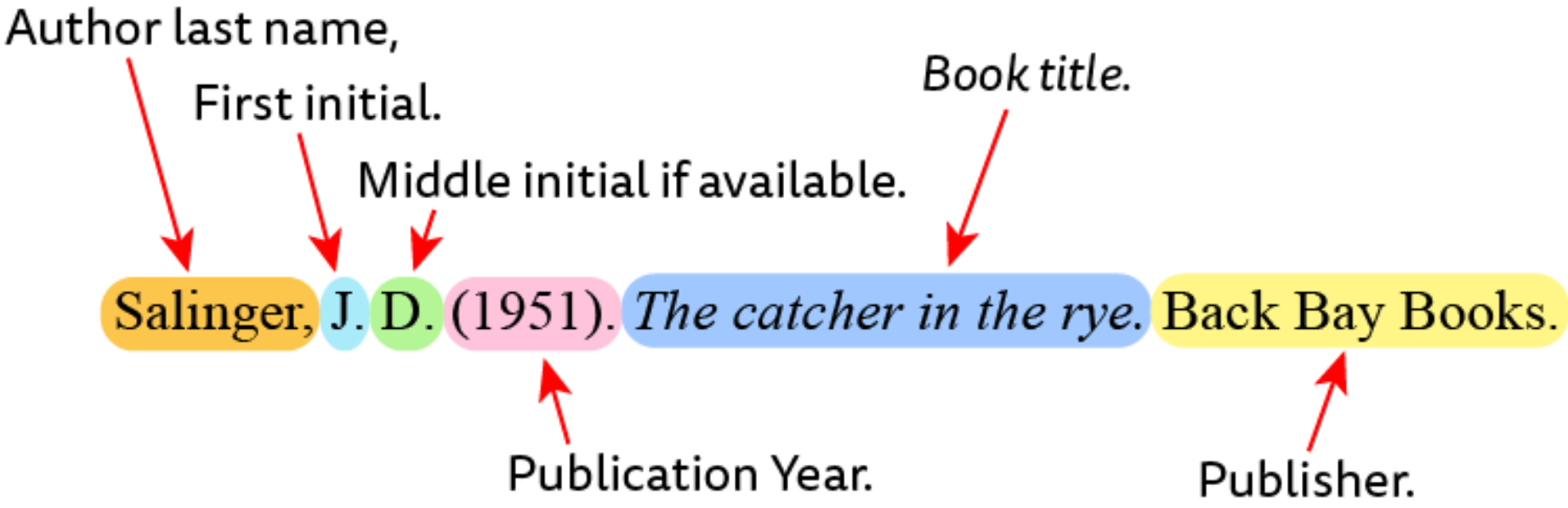
- Measurements devices
- The experiments treatments
- The assignment of subjects to conditions
- The order of assessments (if more than one)
- The time period (if pertinent) and
- Any design features to control potentially unfounding variables.

# Style & Page running

The results section presents the data and the statistical analyses. This does not include the implications of the findings. All the relevant findings including the ones that do not support the hypotheses are presented. When the data is complex, it can be presented in tables and figures; care should be taken to see that they are complementary and not out of work.

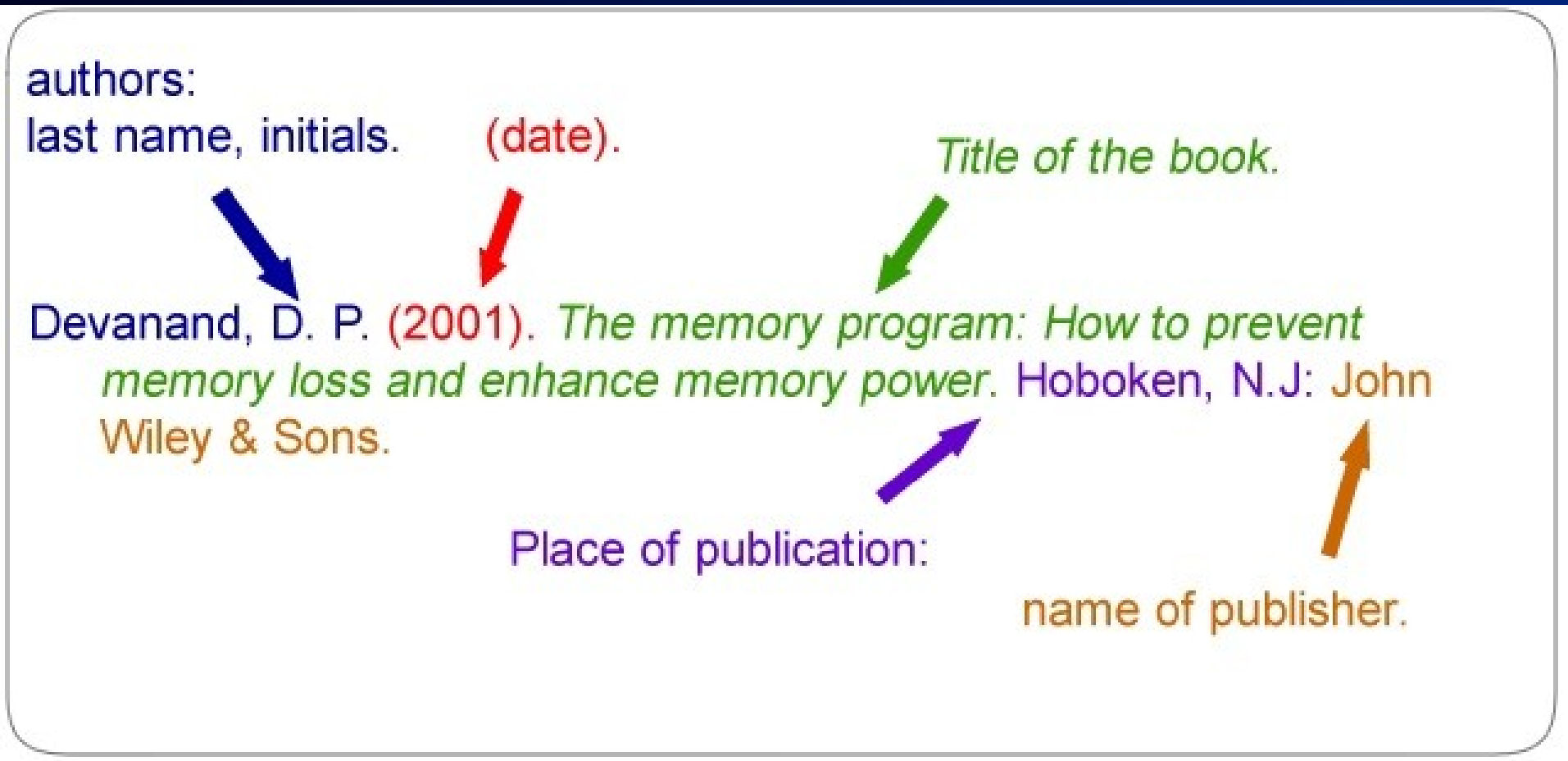
The results section ultimately enables discussion. The implications of the study including whether the hypotheses were supported or rejected are explained. Both the theoretical as well as practical implications of the study should be described. A brief description of the limitation of the study and suggestions for further resource is relevant.

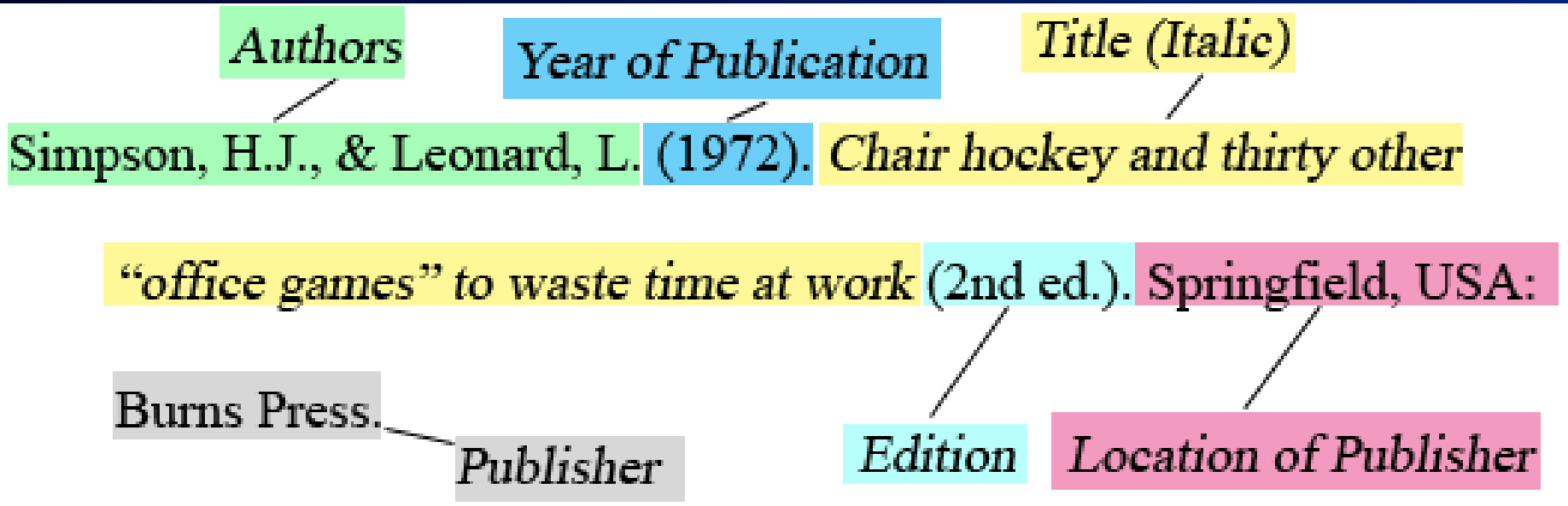
# APA Book Citation



# APA

Authors
Publication Date
Article Title
Ickes, M. , & Cottrell, R. (2010). Health literacy in college students. Journal of American College Health, 58(5), 491-498.
Volume
Issue
Page Numbers
Journal Title


authors:
last name, initials.
(date).
Title of the book.
Devanand, D. P. (2001). The memory program: How to prevent memory loss and enhance memory power. Hoboken, N.J: John Wiley & Sons.
Place of publication:
name of publisher.


Authors
Year of Publication
Title (Italic)
Simpson, H.J., & Leonard, L. (1972). Chair hockey and thirty other
"office games" to waste time at work (2nd ed.). Springfield, USA:
Burns Press.
Publisher
Edition
Location of Publisher

# References

- This begins on a new page, “centered”.  This consists of all documents like journal articles, books, unpublished work etc.  A bibliography contains everything that would be in the reference section plus other publications that are useful but were not cited in the body. They are arranged in alphabetical order by last named of the first named authors.  When no author is listed, the first word of the title or sponsoring organization is used to began the entry.  Each reference starts at the left margin of the page, with subsequent lines doubles spaced and indented

# Appendices

- The appendix may contain a new computer programme, unpublished tests etc. Each appendix begins in a few page with the label “Appendix” and its identifying letter “centered” .

# Styles of writing

- The research report should be presented in a style that is creative, clear and concise. It should be explained in simple language and short and coherent sentences. Slang hackneyed or flippant phrases and folksy style should be avoided. Since objectivity is important, elements of exhortation or persuasion should be avoided. Only the last named of the cited author are used. Titled like professor, Dr, Mr and Dean are omitted. Since the research procedure is already over, it should be presented in past tense.

# Typing The Report

- Typographical standards for the thesis or dissertation are more exacting.  Strikeovers, crossovers, insertions and erasures are not permitted.  The writer has to present the manuscript material to the professional typist in proper form. It is the responsibility of the writer to correct the major errors.  The following are the rules of typography.
- A good quality of bond paper, 8.5” by 11” in size and of 13 to 16 pound weight, should be used.  Only one side of the sheet is used in typewritten manuscript.
- All margins should be 1.5 inches- top, bottom, left and right.
- All material should be double spaced.

# Typing The Report cont...

- Words should not be divided at the end of the line unless completing them would definitely interfere with the margin. A few spaces of run over is preferable.
- Direct quotation not over three typewritten lines in length are included in the text and enclosed in quotation marks.  Quotations of more than three lines are set off from the text in a double spaced paragraph and indented five spaced from the left margin without quotation marks.  Original paragraph indentations are retained.
- Page numbers are given in parentheses at the end of a direct quotation.
- Underlining words or letters informs the printer to set those words or letters in italics.

# Reference Form

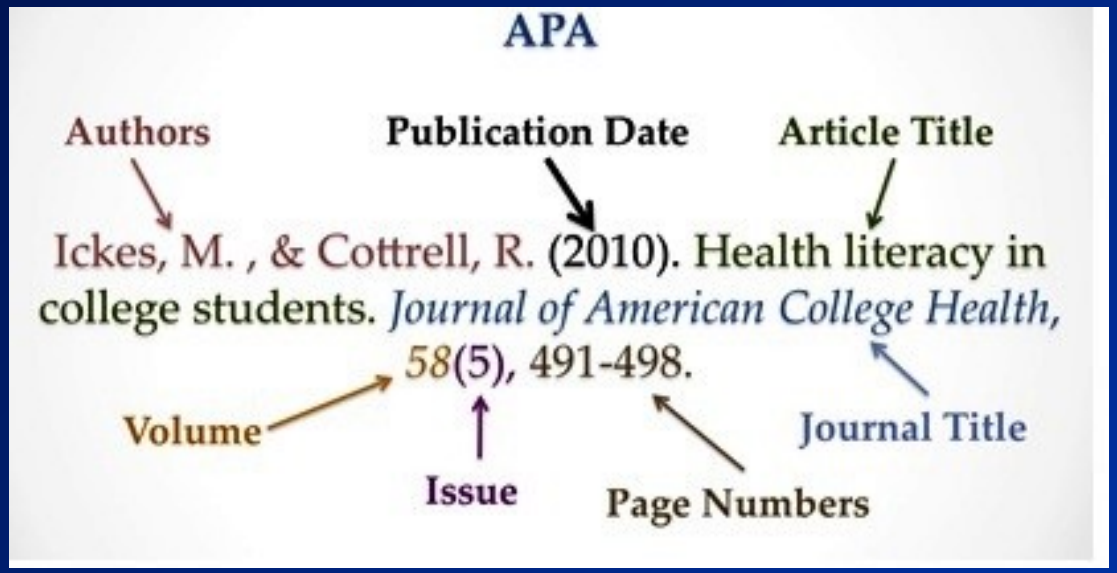
The following guidelines should be followed.

- The last name(s) of the author(s) and the year of publication (Reddy, S (1998))
- In the case of unpublished citations, the year the reference was written.
- If the author’s does not appear in the text, the name and year appear in parentheses, separated by a comma.
- If the author’s name is used in the text, the year follows the name in parentheses.
- When more than one work is cited in parentheses, the references are separated by semicolons.
- Page numbers are only given in parentheses for direct quotation.
- All materials referred to in the text, and only those, are listed alphabetically on the reference section of the manuscript.

# Illustrations

The following are the illustrations:

- Book: Vaizey, j. (1967). Education in the modern world.  New York: McGraw Hill.
- Book with multiple authors: Barzun, J. & Graff, H.F>(1977). The modern researcher. New York: Harcourt, Brace, Jovanovich.



# Pagination

- Each page of one paper is assigned page number. Though the title page does not have a page number on it, it is allowed in the series. Page numbers are placed in the upper right-hand corner, one inch below the top of the page and aligned with the right margin. Pages are numbered consecutively from the title page, through the abstract, main body and references. After the references come the footnotes (if any), the numbering of pages continuing in this order.

# Tables

- A table is a systematic method of presenting statistical data in vertical columns and horizontal rows, according to some classification of subject matter. Tables enable the reader to comprehend and interpret masses of data rapidly and to grasp significant details and relationships at a glance. Tabled and figures should be used sparingly. Good tabled are relatively simple, concentrating on a limited number of ideas.
- The word table is centered between the page margins and typed in capital letters followed by the table number in Arabic numerals.
- Eg. Table 2

# Tables

- Tables are numbered consecutively throughout the entire thesis, including those tabled that may be placed in the appendix. The title is placed one double space below the word table and centered. The main time should be brief, clearly indicating the nature of the data presented.
- Column headings or box heads, should be clearly labelled, describing the nature and units by measure of the data listed. If percentaged are presented, the percentage symbol (%) should be placed at the top of their column, not with the number in the table. Asterisks are used to indicate probability levels and are placed below the table.

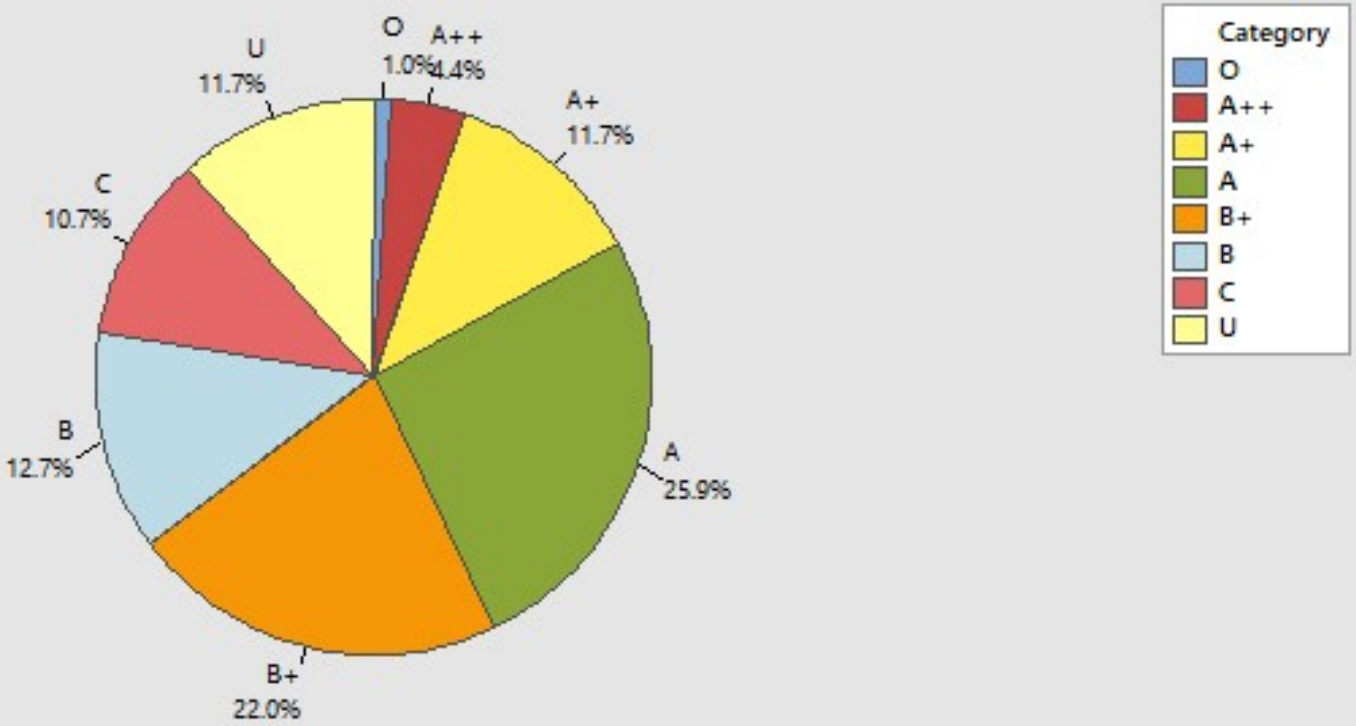
# Figures

- A figure is a device that presents statistical data in graphic form. The term figures include graphs, charts, maps, sketches, diagrams and drawings. A good figure enables clear and easy understanding of data. They are not substitutes for textual description but are used to emphasize certain significant relationships. Most of the qualities of good tables apply to figures too.

# The Students of the B.Sc. AHS obtained their grade in the Psychology Paper

## The School of Allied Health Sciences, Arupadaiveedu Medical Collge Campus, Puducherry

## Examination of February 2020




*S.Lakshmanan, Psychologist created this Graph*

# Types of charts

There are several different types of charts and graphs. The four most common are probably

- 1. line graphs,
- 2. bar graphs and histograms,
- 3. pie charts, and
- 4. Cartesian graphs.

They are generally used for, and best for, quite different things

## School of Allied Health Sciences

**Aarupadai Veedu Medical College Campus, Puducherry**

**Emotional Intelligence Study**

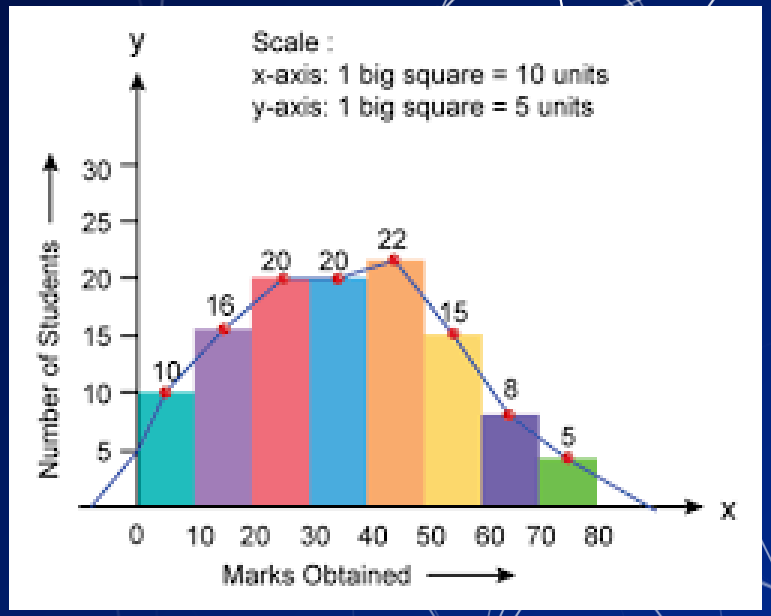
Dated: 6th Jan 2021

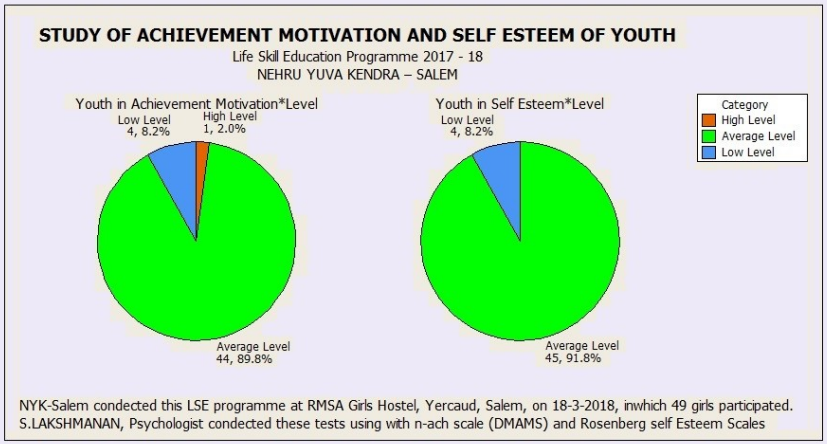
| Average | Median | Range |
|---|---|---|
| 24.71 / 31 points | 26 / 31 points | 14 - 30 points |

Total points distribution

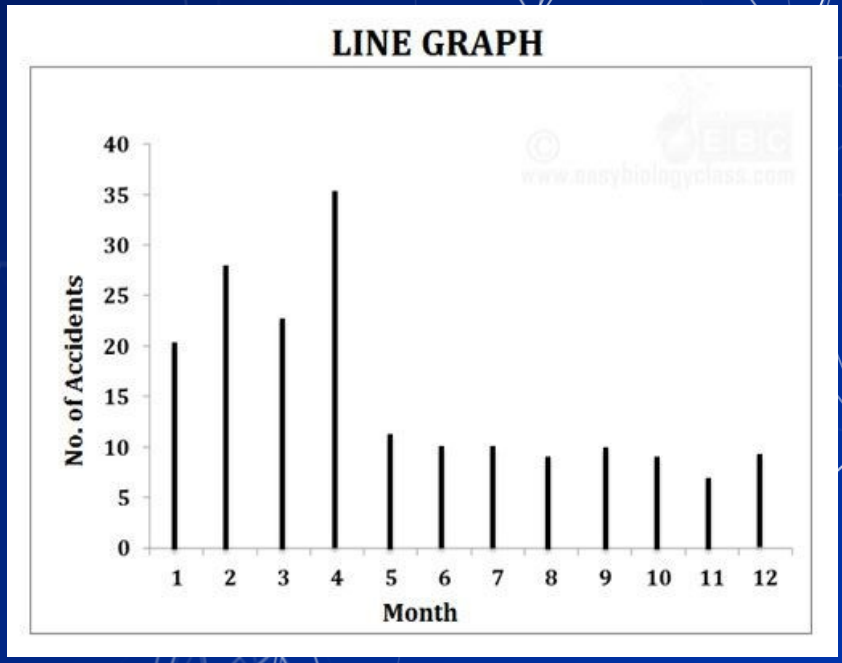
Studied by EIS-Sans - Emotional Intelligence Scale by Arun Kumar & Shruti Narain

Tested in Soft Skill & Communication Class





STUDY OF ACHIEVEMENT MOTIVATION AND SELF ESTEEM OF YOUTH
Life Skil Education Programme 2017 - 18
NEHRU YUVA KENDRA – SALEM
Youth in Achievement Motivation*Level
Youth in Self Esteem*Level
Category
High Level
Average Level
Low Level
Average Level 44, 89.8%
Average Level 45, 91.8%

NYK-Salem condected this LSE programme at RMSA Girls Hostel, Yercaud, Salem, on 18-3-2018, inwhich 49 girls participated.
S.LAKSHMANAN, Psychologist condected these tests using with n-ach scale (DMAMS) and Rosenberg self Esteem Scales



# Order information tools

- ***Order***
- *the arrangement or disposition of people or things in relation to*
- *each other according to a particular sequence, pattern, or method.*
- Here we will discuss about
- Chronology for a narrative
- Stages of a process
- From general to specific and vice versa
- From most important to least important
- Advantages and disadvantage
- Comparison and contrast
- Problem solution pattern

# Chronology for narrative

- Chronology meaning (of a record of events) following the order in which they occurred.
- Using **chronology as narration** involves relating **events** in the order in which they occur. A speaker will almost certainly employ narrative chronology if he or she uses an anecdote or extended example, but as demonstrated by the sample outline below, whole speeches can be organized this way.

# Chronology for narrative Cont..

- When information in a passage is organized by the time in which each event occurred, it is organized chronologically.
- Nonfiction passages that are organized chronologically often contains dates. Fiction passages or narratives are more subtle and are organized chronologically but usually have no dates.
- A narratives or story is a journey through time, and all of the events are arranged in order of time; therefore, every story has a beginning, middle, and end.
- Even if an author uses flashbacks, flash-forwards, or otherwise manipulates the time in his or her text, the events still occur along a timeline.
- Stories require the passage of time; therefore, all stories are organized chronologically. Sometimes time will stop in a narrative.

# Thesis or dissertation abstracts

- An abstract is a condensed report of about 100 to 200 words, focusing on the methods, results and conclusions of the study. The abstract is intended to give just enough information for the reader to decide whether the study will be of personal interest.
- The abstract should include the research question, a description of the subjects, a brief accounting of methodology, the results and derives conclusions. As the most important part of the study the conclusions receive major emphasis in an abstract.

# Thesis or dissertation abstracts Cont..

- In order to convey the real meaning to the reader, words should be used carefully in this condensed version.
- Oral and poster presentation of paper in a conference
- Presentation of a paper in a conference needs special skills. The whole information has to be communicated within the time allotted. Hence oral presentation should be crisp, simple and clear. Poster presentation can supplement this. Hence the poster should be clear and vivid. It should enable easy understanding of rich information. It should be presented in a place which is well illuminated and which is visible to every participant.

# Arrangement of chapters

- Introduction
  - need for the study
  - objectives of the study
  - hypothesis
  - limitations of the study
  - chapterization
- Review of related literature
- Methodology
- Results and discussion
- Finding, conclusions and suggestions for further research.

# Use of computers for research

Self Control
Task Cards
If you are getting frustrated, why is it a good idea to calm down?
Maya waited to eat dessert until after dinner. Is this self control?
Name one time when you didn't practice self control at home.
Grace waited her turn to get on the tablet. Is this self control?
You want to tell your friend about your weekend during class. What can you do instead?
What does self control mean?

Analysing compiles data has been made practical by computers. The computer can perform many statistical calculations easily and quickly. The steps in raising a computer to calculate statistical analysis are

1. Data organization and coding
2. Storing the data in the computer
3. Selection of appropriate descriptive and inferential statistics
4. Selection of appropriate programs for the desired statistics
5. Writing of control cards
6. Execution of the computer programme. Thus computers have made research activity easy and efficient.

# Thank You